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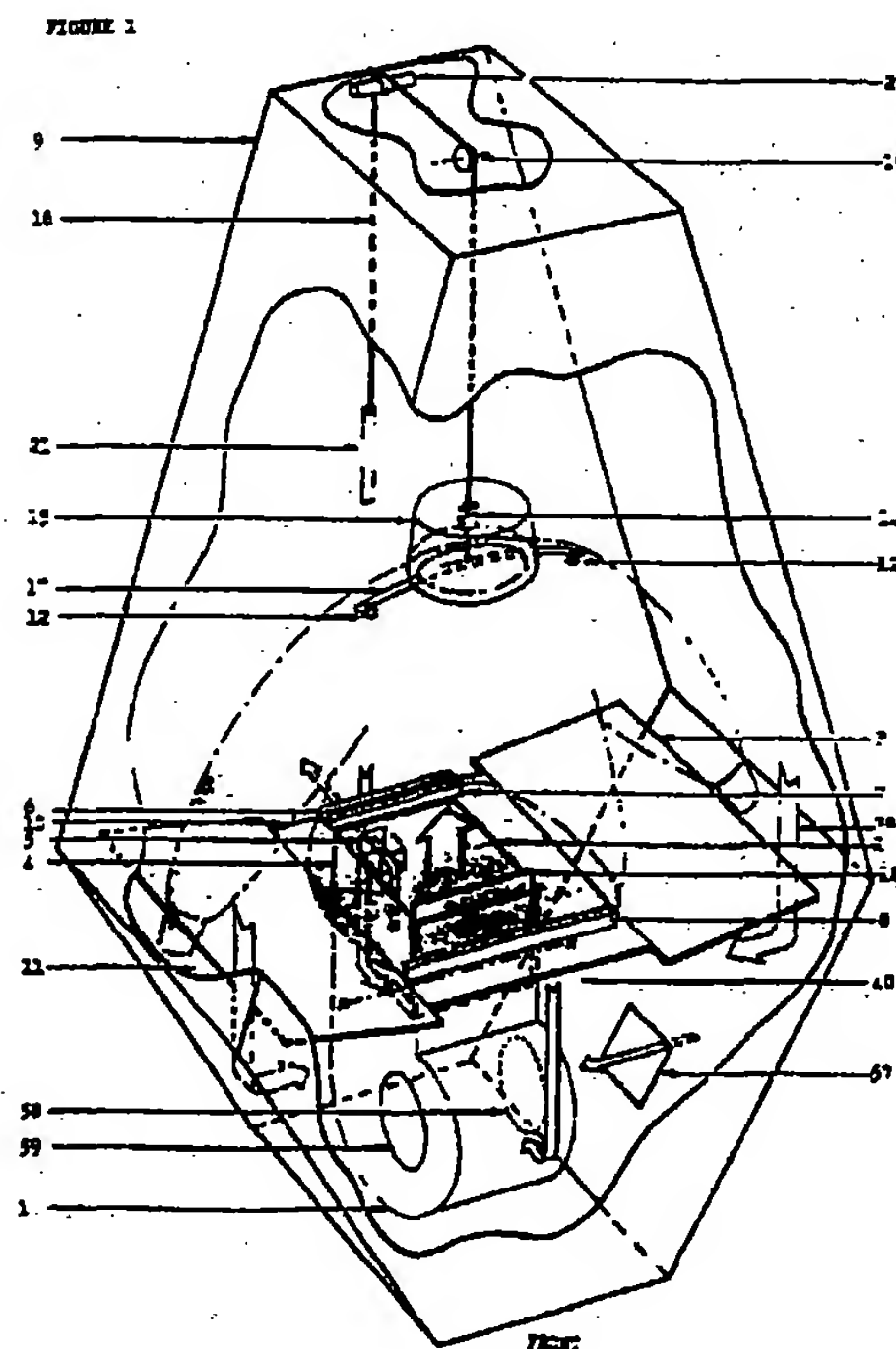
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(54) **Fabric smoothing and drying device**

(57) *Smoothing.* A fan 1 in enclosure 9 discharges upwards over a heater in duct 4 to inflate a fabric article to impart an ironed appearance after drying. The article is releasably held by fixed clamps 6,7 and adjustable clamp 8 and supported by adjustable hanger 17 or clips 12 suspended by cord 16. Air escaping past or through the article is recirculated to the fan inlets 58, 59 via openings 10, 11, 39, 40 which create currents in the recirculating air to enhance drying in specific areas. Major discontinuities in the article are sufficiently closed by clips (12, Fig 3,4) or baffle 15 or by causing the abutting fabric to form two close and parallel or overlapping edges held taut. There is a net flow of air through the device inducted via inlet 57 and exhausted via outlet 5.

Drying. Fabric articles accommodated within a stationary receptacle (Fig 11) releasably located over duct outlet 2 are agitated and dried in the upward air stream. Sections of the device can fold inwards to facilitate storage.



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FIGURE 1

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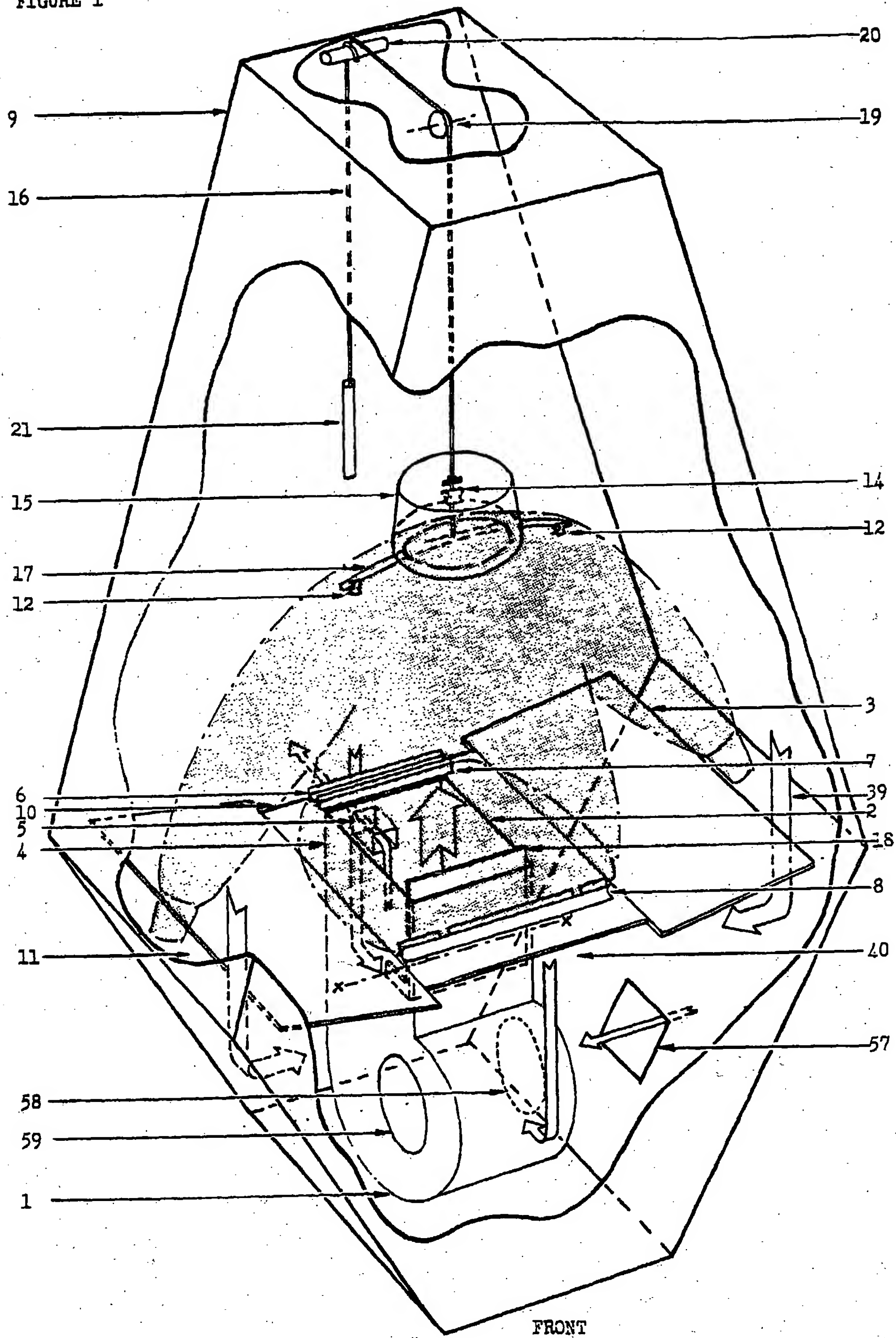


FIGURE 2

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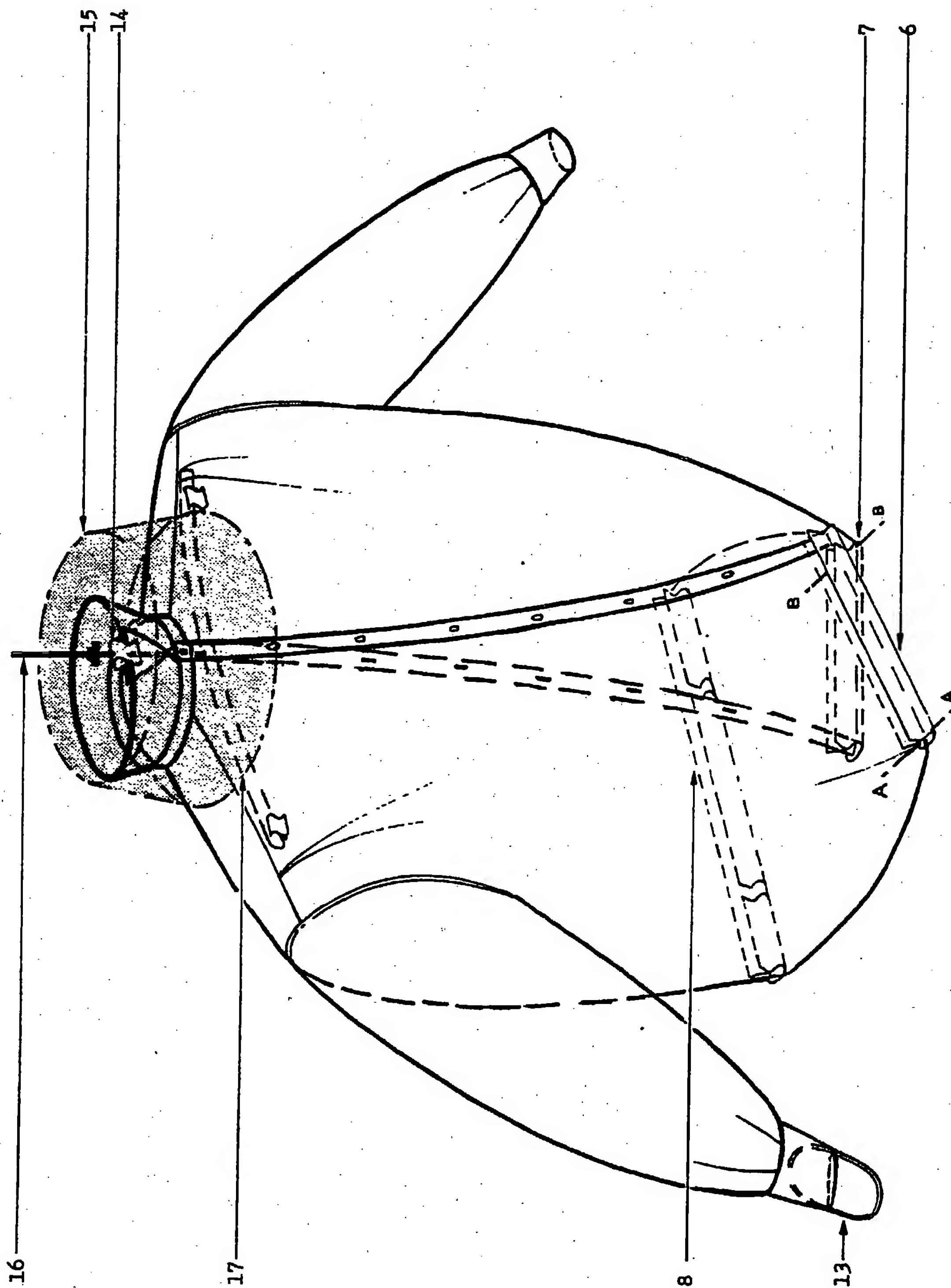


FIGURE 3

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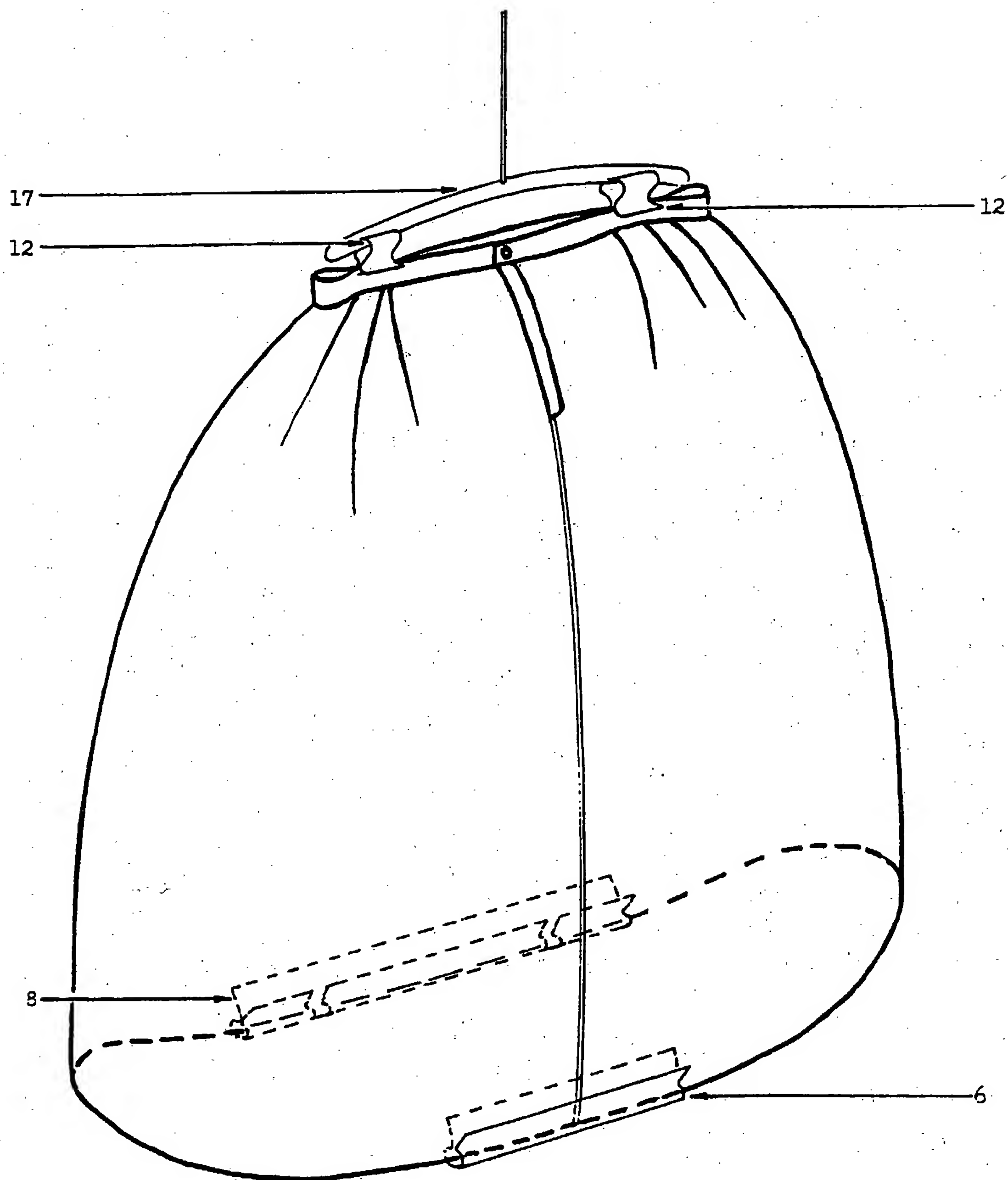


FIGURE 4

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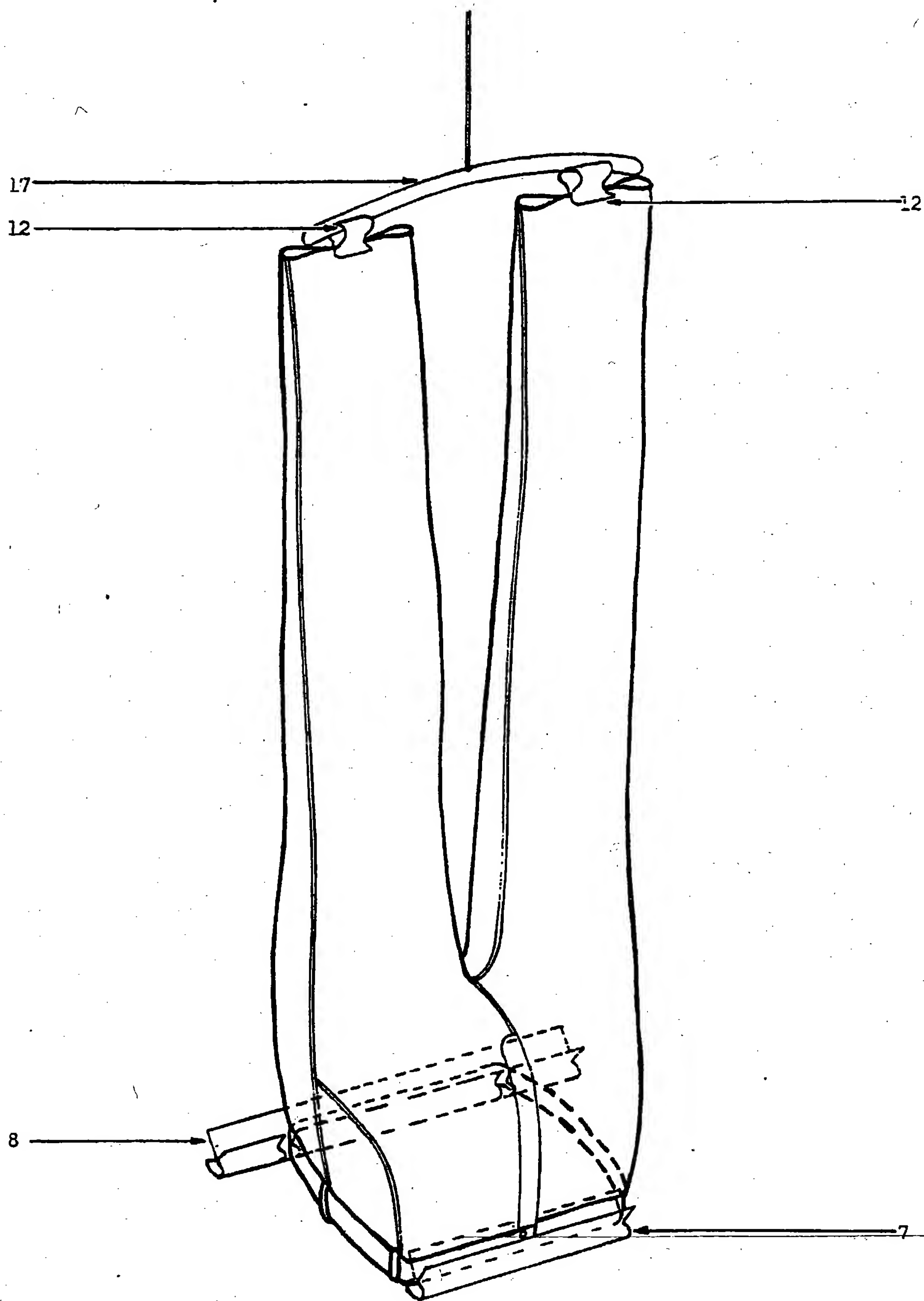


FIGURE 5

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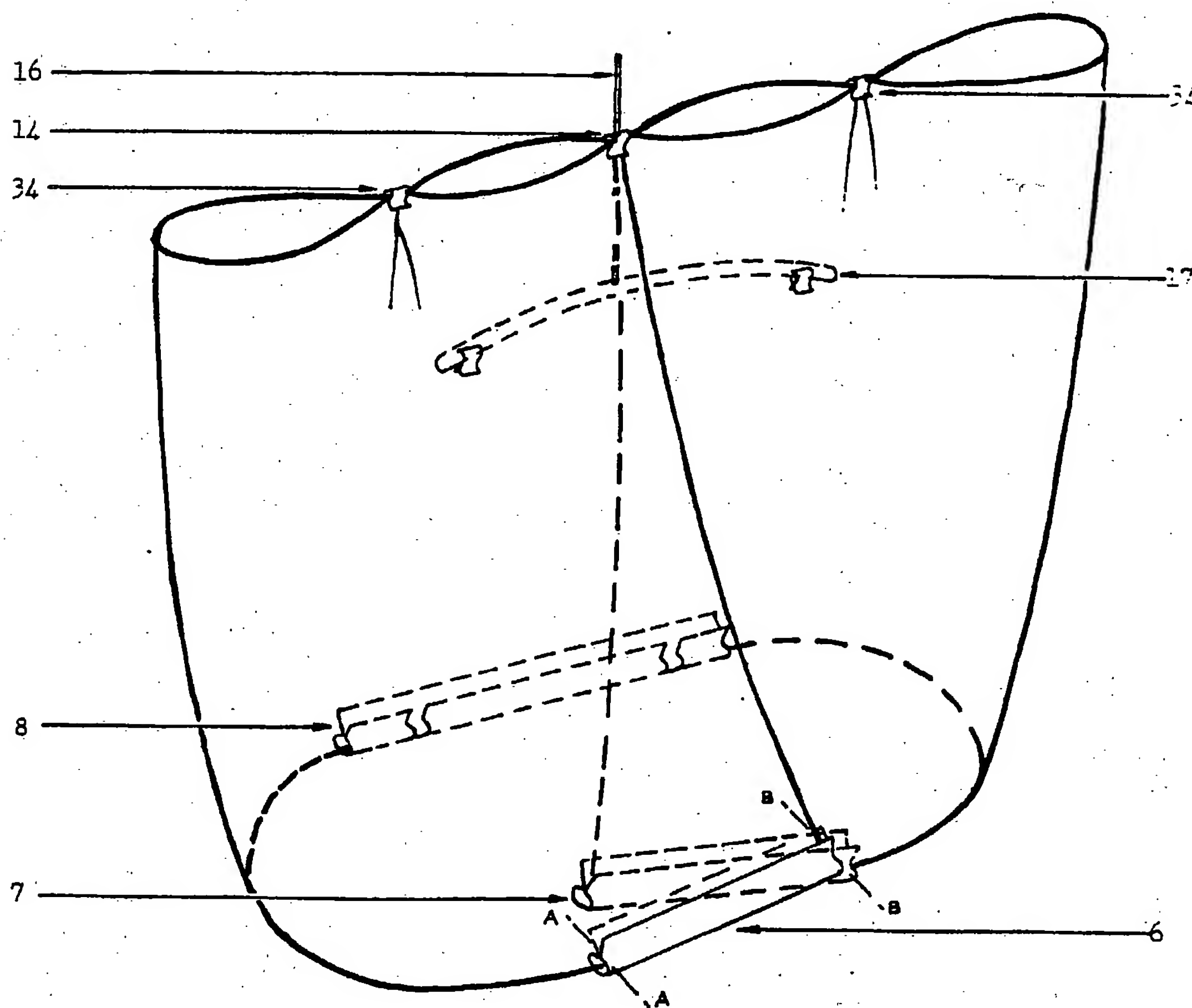
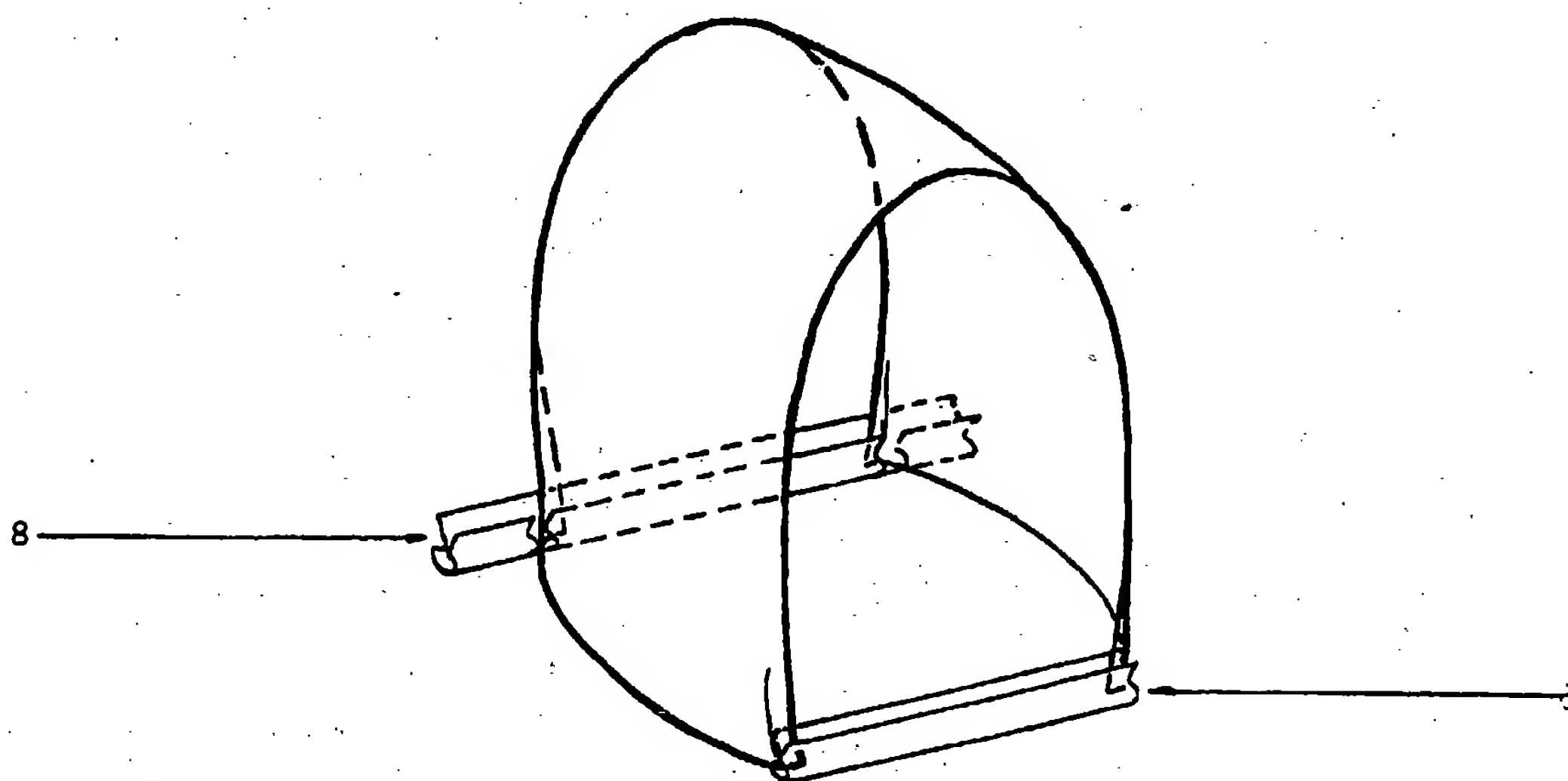


FIGURE 6

FIGURE 7

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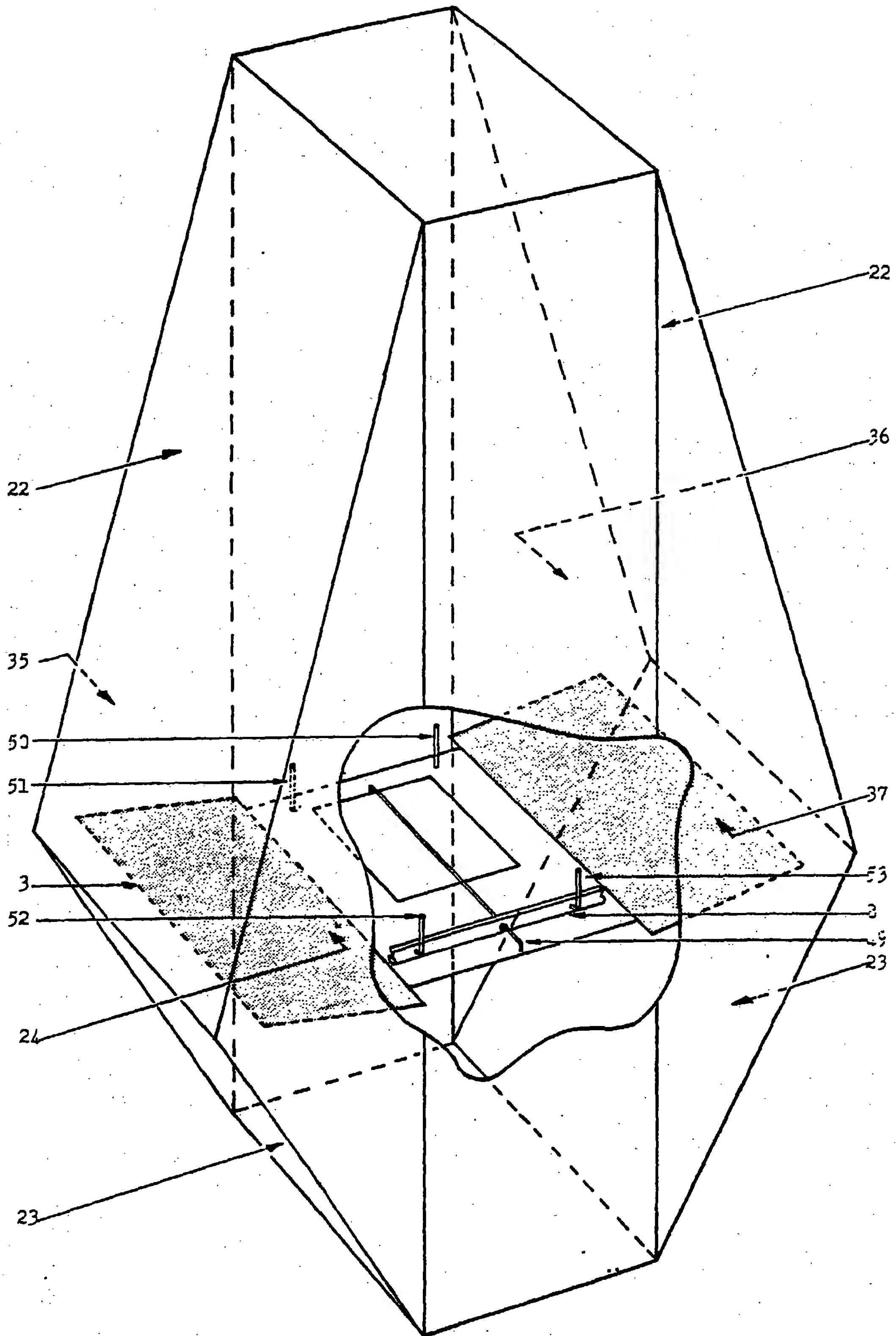


FIGURE 8

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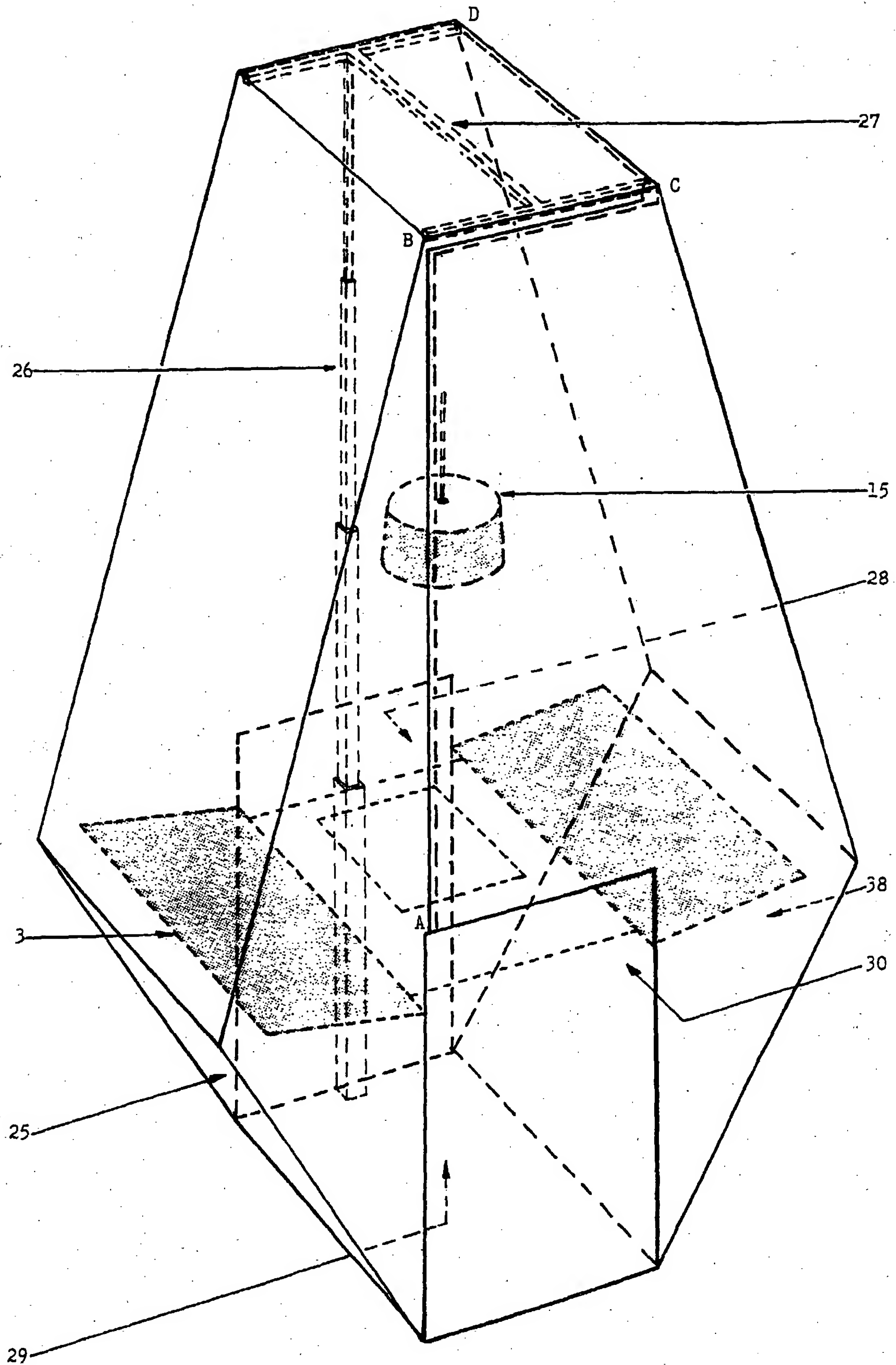


FIGURE 9

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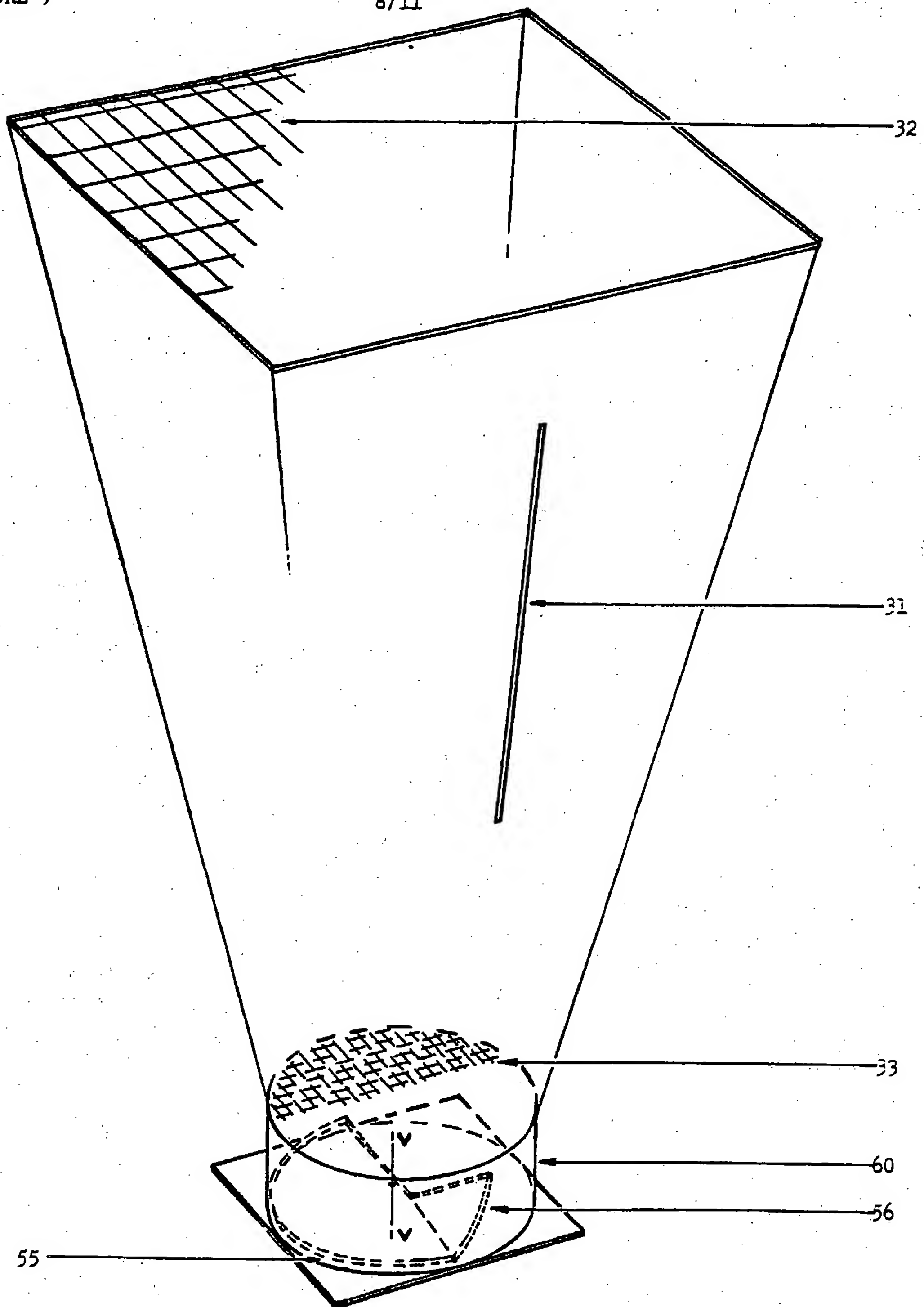


FIGURE 10

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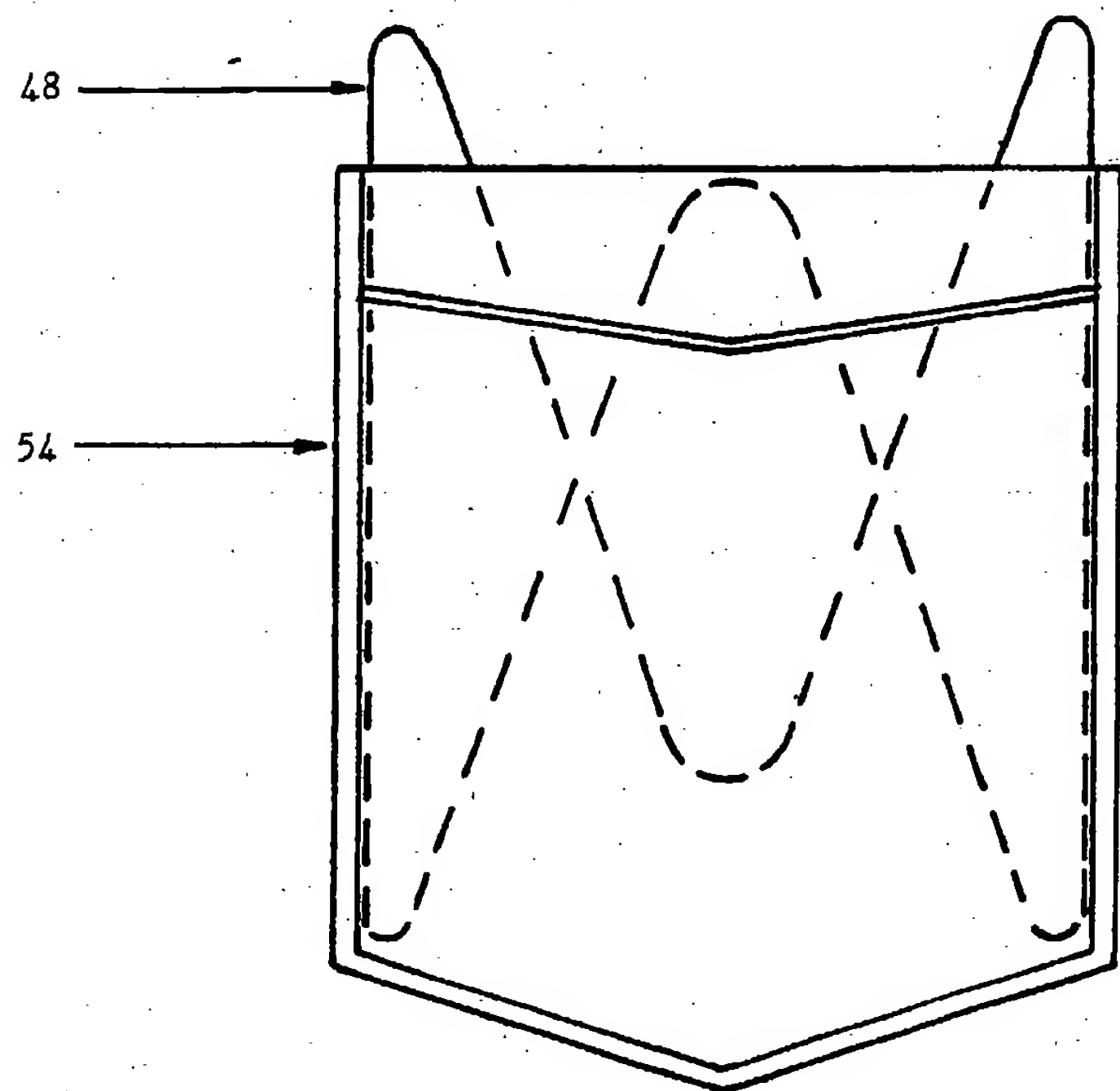
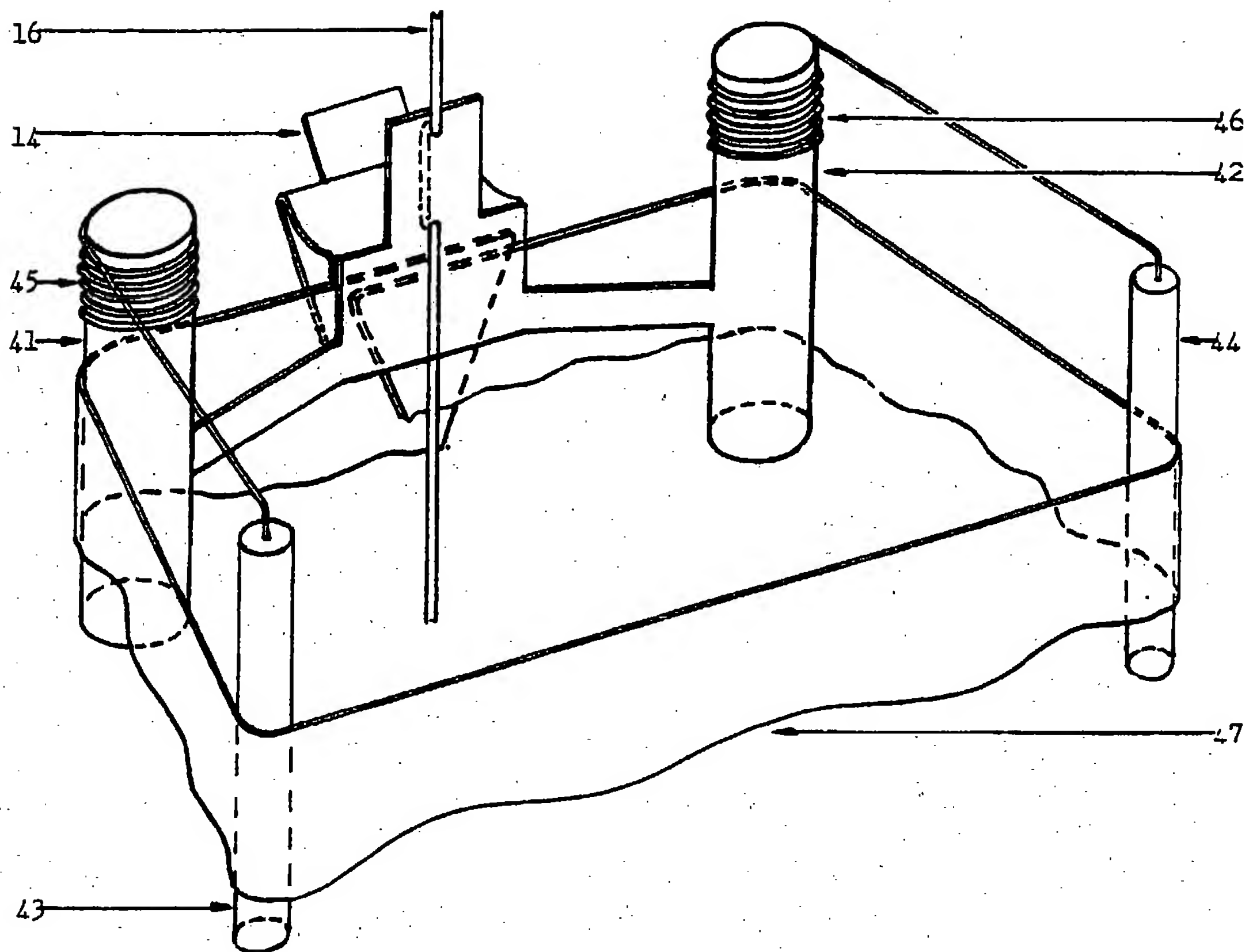


FIGURE 11

FIGURE 14

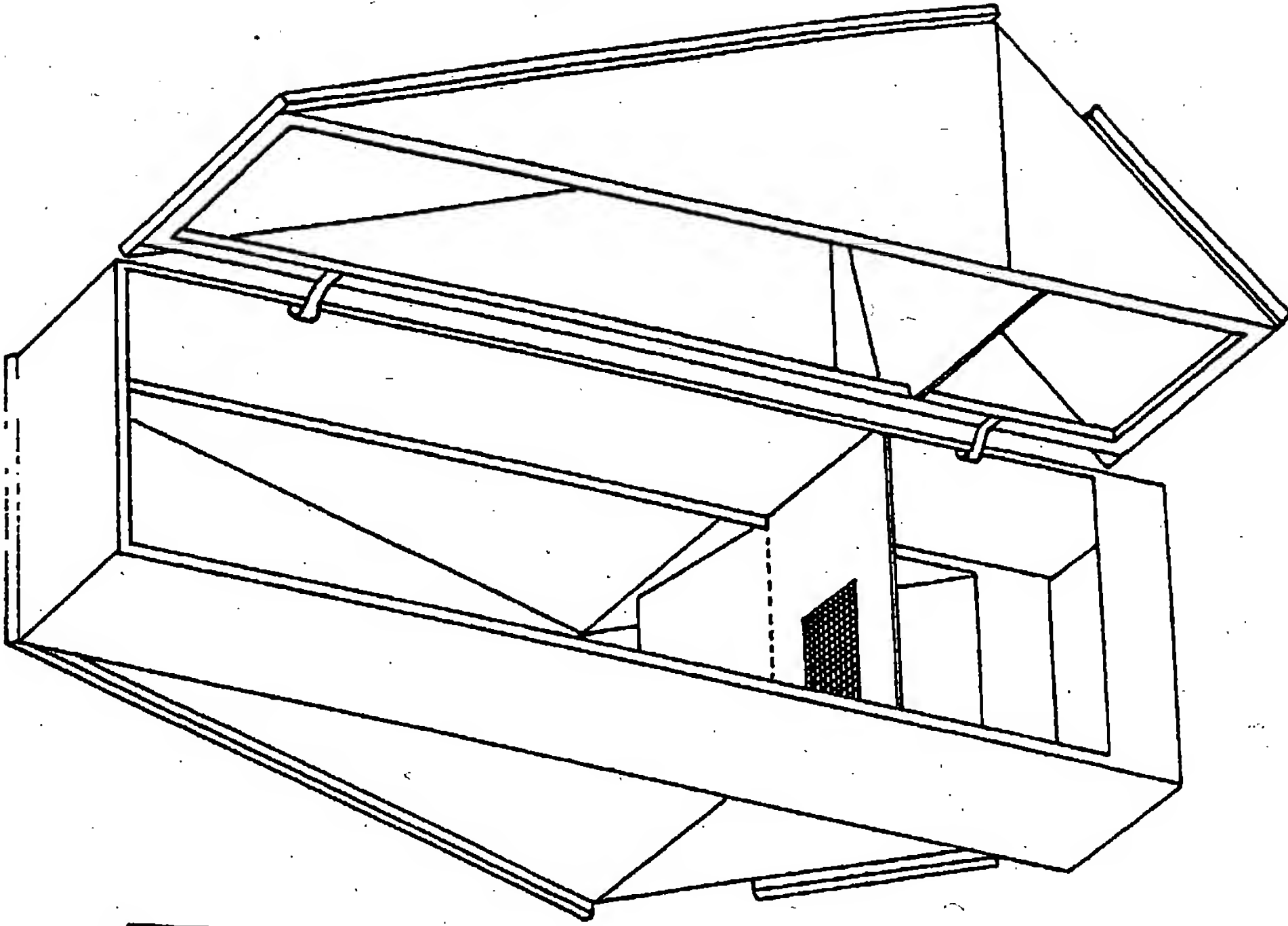


FIGURE 13

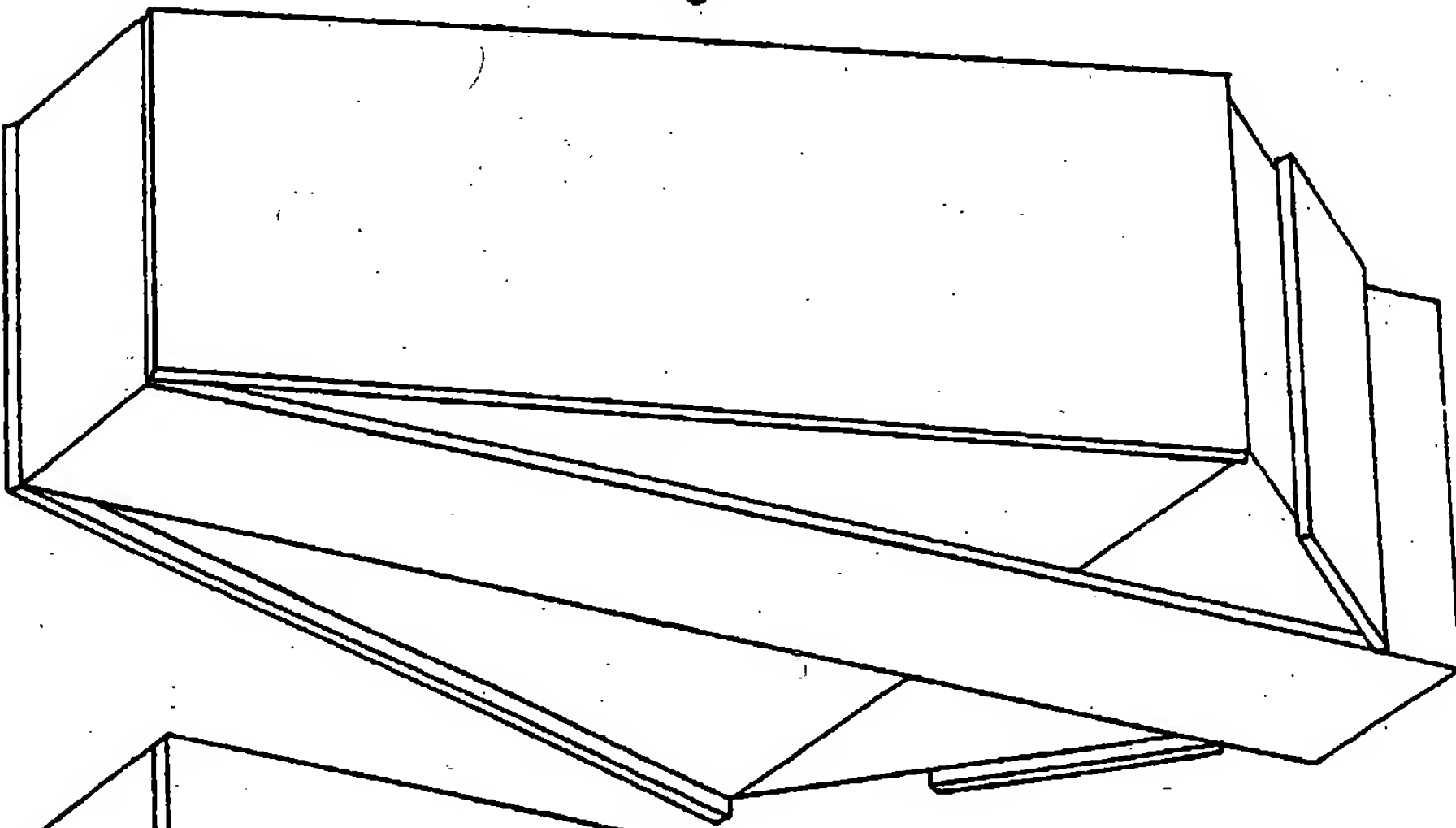


FIGURE 12

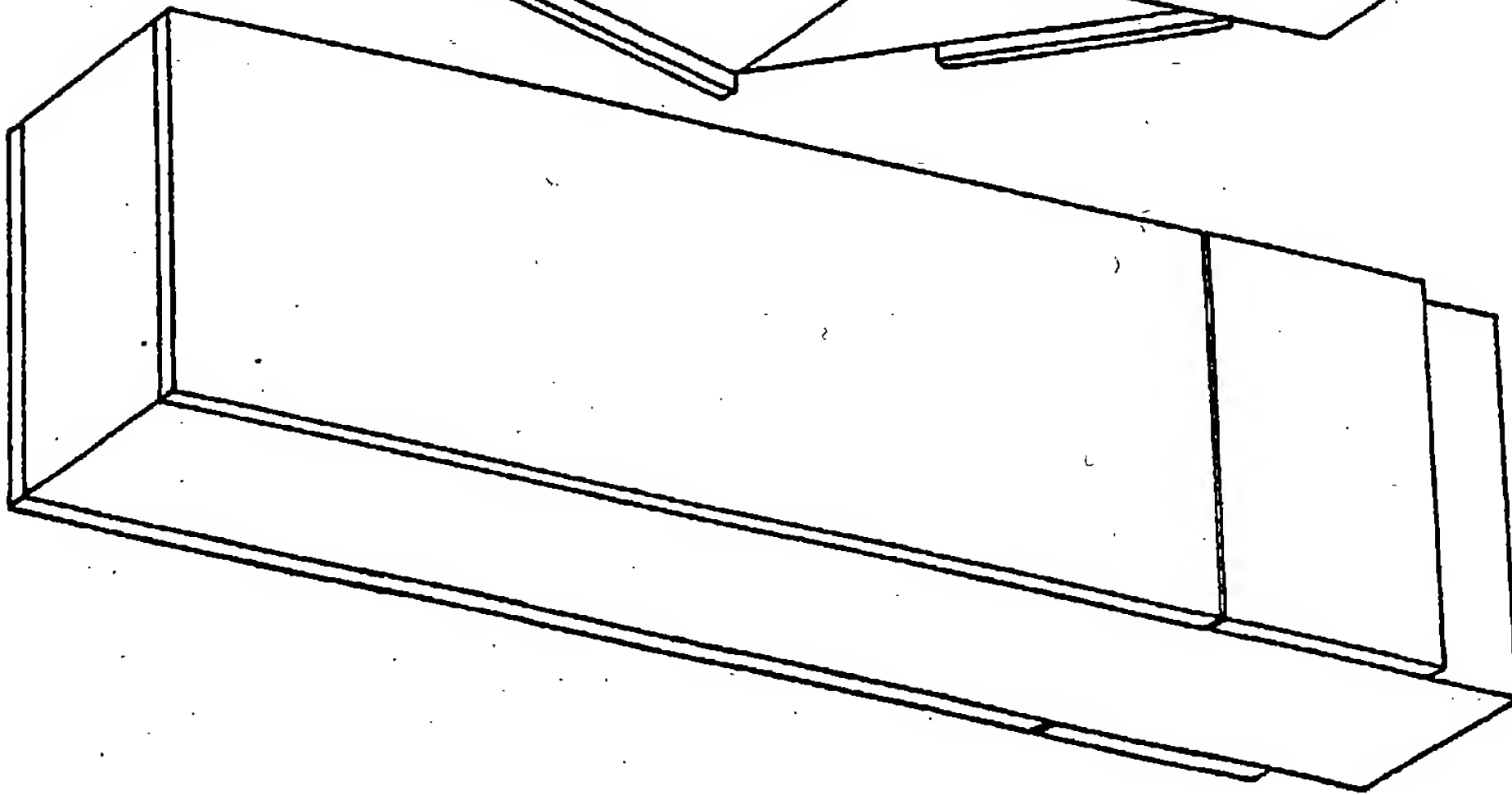
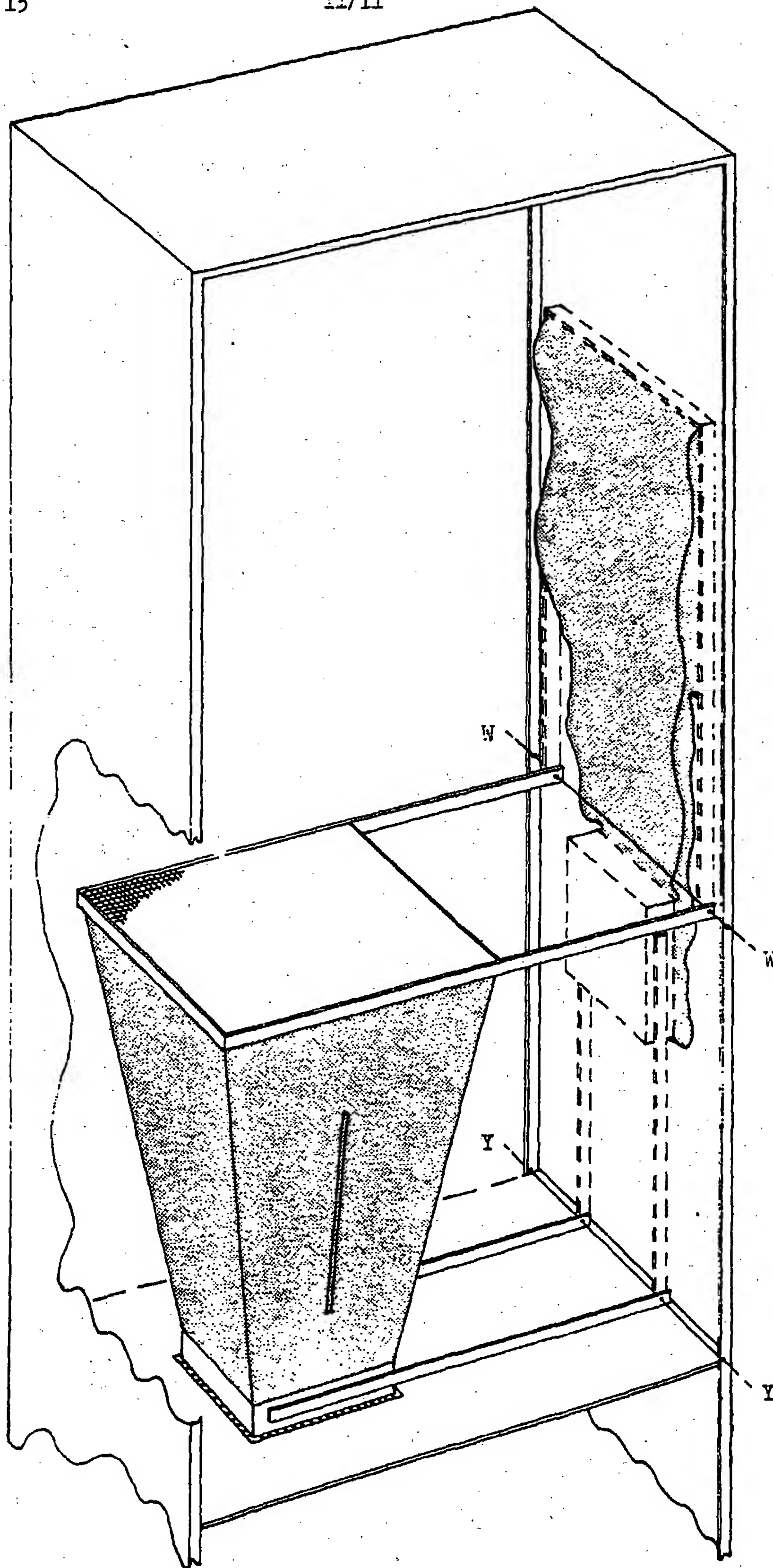


FIGURE 15

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GB Text

FABRIC SMOOTHING AND DRYING DEVICE

This invention relates to a device which can dry and/or impart an ironed appearance to damp or dry garments, linen or fabric.

According to one aspect of the present invention there is provided a device to dry and impart an ironed appearance to fabric articles comprising an enclosure, a pressuriser and heater for creating a heated recirculating gas or vapour stream passing through the enclosure, means for exhausting a proportion of said stream and replacing it by fresh gas or vapour drawn in, means to accommodate a fabric article in said enclosure such that it forms a sufficiently closed surface about or within the gas or vapour stream to inflate with sufficient resulting tension in the fabric to impart an ironed appearance after drying.

According to another aspect of the invention there is provided a device to dry damp fabric articles

comprising an enclosure, a pressuriser and heater creating a heated recirculating stream of gas or vapour passing through the enclosure, means for exhausting a proportion of said stream and replacing it by fresh gas or vapour drawn in, and a stationary receptacle in said enclosure through which the heated gas or vapour stream passes upwards such that fabric articles within said receptacle are agitated and dried.

The exhausted proportion will normally be a small proportion of the flow, selected to balance the need to carry extracted moisture out of the device, with the need to avoid undue loss of heat from the device.

The device may comprise one or more of the features set out below.

1) provision is made for steam to be mixed with the gas or vapour to relax the fabric fibres, if necessary, prior to drying.

2) means is provided to create gas or vapour currents within the enclosure and outside the article for preferential drying of specific areas of the article.

3) means are provided for directing gas or vapour currents preferentially to specific areas of said enclosure to enhance drying in the regions of said specific areas.

4) means are provided to create currents in the gas or vapour to enhance drying in the regions of said currents and means are provided to vary the direction and magnitude of said current.

5) provision is made for said recirculating gas or vapour to recirculate via openings located in specific areas of the enclosure, said openings producing concentrations of flow in the recirculating gas or vapour to enhance drying in the regions of said openings.

6) provision is made to vary the relative volume of gas or vapour recirculating through different said openings.

7) provision is made to adjust the location within the enclosure of said openings.

8) a device is provided for releasably holding a said article along one or more lengths of an edge of said article such that the held and unheld portions of

said edge are continuous or overlapped to form a boundary about the said stream entering the interior of the inflated article.

9) provision is made for devices to releasably hold the article along two or more lengths of the edges of said article in two regions oppositely disposed about the gas or vapour stream entering the inflated article interior such that the fabric of and interlinking said regions is continuous or overlapping to form a boundary about said gas or vapour stream.

10) said holding devices each hold a length of the article fabric which is greater than the corresponding dimension of the cross section of the gas or vapour stream entering the inflated article interior in the plane of the holding devices.

11) provision is made for adjustment of one or more of the holding devices relative to the axis of the gas or vapour stream entering the inflated article interior in the plane of the holding devices.

12) provision is made for the fabric interlinking the holding device or devices to be maintained sufficiently clear of high velocity currents in the gas

or vapour stream to prevent the induction of undue instability in said fabric.

13) provision is made to vary the cross sectional area of the gas or vapour stream entering the inflated article interior such that it flows within the said boundary.

14) provision is made for one or more of the article holding devices to be adjustable in attitude so as to adapt to the angle naturally assumed by the held edges of the inflated article.

15) clips are employed to substantially close discontinuities in the fabric article to restrict the passage of gas or vapour.

16) means are provided whereby one or more main discontinuities in the article is substantially closed by abutting fabric forming two close and parallel or overlapping edges held taut, by said means.

17) fixed, folding or adjustable baffles are employed to restrict the passage of gas or vapour through major discontinuities in the inflated article.

18) means is provided to direct the gas or vapour escaping via a discontinuity around the outside of the article to enhance fabric drying in the vicinity of said discontinuity.

19) a frame is provided to support the article internally before and after inflation.

20) the article is supported by clips suspended by means provided in said enclosure.

21) said frame and clips are suspended by a cord constrained such that the vertical position of the frame and clips is maintained unless subject to an upward force sufficient to counteract the combined weight of the frame, clips and any other suspended components or a downward force in excess of that produced by the frame, clips and aforementioned components plus that of the heaviest article to be accommodated within the device.

22) means is provided for the simultaneous withdrawal from the enclosure of the article holding devices and frame suspension system with suspended components whilst maintaining the relative positions of said items.

23) the article is accommodated inside-out.

24) further means is provided to hold areas of the article taut to impart an ironed appearance when dry.

25) provision is made for sections of the device to fold or slide inwards such that a more compact form ensues for the purpose of storage.

26) sections of the device are fabricated of flexible material supported such that the means of support and the flexible sections can be collapsed such that the device assumes a more compact form for the purpose of storage.

27) flexible sections provided in the enclosure derive support from a collapsible telescopic support.

28) means is provided to mount the cord constraint system on and/or within said telescopic support.

29) means is provided for the pressuriser output to be regulated to produce a predetermined fabric tension in one or more regions of the inflated article.

30) at least part of the pressuriser output characteristic is selected to produce a predetermined limited range of fabric tension in a range of similar articles differing in size.

31) means is provided for a proportion of the recirculating gas or vapour to be exhausted from the outlet of the pressuriser.

32) means is provided for the pressuriser output to be operator controlled or preset or a function of article type, size, fabric type or any combination of the foregoing.

33) means is provided for the ratio of gas or vapour recirculated to that exhausted to be preset or operator controlled or a function of: time; internal humidity; or both.

34) means is provided for the recirculating gas or vapour temperature to be operator controlled, preset or preset according to fabric type.

32) means is provided for the individual duration of operation of pressuriser, heater, steam source and proportion of gas or vapour recirculated to be operator

controlled; preset; preset according to article type size weight or fabric type; or any combination of the foregoing.

33) means is provided for termination of the drying process to be dependent upon the humidity of the recirculating gas or vapour.

34) the recirculating stream consists of air.

35) the pressuriser and/or heater is located within the enclosure.

36) the article has an inside and an outside, and is disposed in said enclosure inside-out.

37) in the case of a device as set out herein above comprising a stationary receptacle in said enclosure through which the heated gas or vapour stream passes upwards such that fabric articles within said receptacle are agitated and dried, means may be provided to periodically disrupt or deflect the upward flow of gas or vapour through said receptacle to enhance agitation of articles within.

The invention further comprises a method of drying

and imparting an ironed appearance to a fabric article, comprising accommodating said article in an enclosure, creating a heated recirculating stream of gas or vapour passing through the enclosure, the said article being so disposed in the enclosure and the said stream being so directed that the article forms a substantially closed surface about or within the said stream and the said stream inflates the article with sufficient tension in the fabric to impart an ironed appearance to the fabric of the article after drying, exhausting a proportion of the said stream, and replacing the exhausted portion by drawing in fresh gas or vapour.

The invention further comprises A method of drying damp fabric articles comprising placing said articles in a stationary receptacle within an enclosure, passing a heated recirculating stream of gas or vapour through the enclosure and upwardly through said receptacle, whereby fabric articles within the receptacle are agitated and dried, exhausting a proportion of the said stream, and replacing the exhausted proportion by drawing in fresh gas or vapour.

Embodiments of the invention will now be described by way of example with reference to the accompanying drawings in which:-

Figure 1 illustrates the device with an accommodated garment inflated.

Figure 2 illustrates the accommodation and inflation of a shirt.

Figure 3 illustrates the accommodation and inflation of a skirt.

Figure 4 illustrates the accommodation and inflation of a pair of trousers.

Figure 5 illustrates one method of accommodation and the resultant inflation of a flat article.

Figure 6 illustrates a second method of accommodation and the resultant inflation of a flat article.

Figure 7 illustrates one form of the device incorporating collapsible sections.

Figure 8 illustrates a second form of the device incorporating collapsible sections.

Figure 9 illustrates a receptacle for fabric drying.

Figure 10 illustrates means to impart an ironed appearance to a shirt collar.

Figure 11 illustrates means to impart an ironed appearance to a patch pocket.

Figure 12 illustrates the device collapsed for storage.

Figure 13 illustrates the device erected for operation.

Figure 14 illustrates the device with access facility open.

Figure 15 illustrates the drying receptacle in operational and storage positions.

DESCRIPTION OF PREFERRED EMBODIMENTS

Referring to figure 1, centrifugal fan 1 is mounted such that it discharges upwards through rectangular duct outlet 2 in baffle 3 via ducting 4 within which are located, in ascending order, exhaust duct 5, a controllable heat source, a thermostat and the outlet of a controllable steam source which is activated if necessary to relax fabric fibres prior to drying. A damp fabric article such as a garment or item of linen is positioned or releasably held by clamps 6,7,8 so as to form a sufficiently closed surface about duct outlet 2 to inflate with sufficient resultant tension in the fabric to impart an ironed appearance after drying. Air escaping past or through the article is contained within enclosure 9 and recirculated via four openings 10,11,39,40 to the fan twin inlets 58,59 where it is mixed with a small proportion of fresh air drawn in via inlet 57 to replace that exhausted via outlet duct 5 resulting in a net flow of air through the device. If the fan has an integral motor, the fresh air drawn into the device is ducted over the motor to facilitate cooling of same.

Because many articles have areas in which the constituent fabric is formed into multiple layers and assume irregular inflated shapes which preclude uniform pressurisation and turbulence of airflow throughout the article, provision is made for the air escaping past or through the article to be formed into currents which sufficiently enhance drying in specific article and enclosure areas such that the disparity in drying rates throughout the accommodated article is minimised and optimised across the range of article types to be accommodated.

Provision to enhance drying in specific article areas comprises rigid baffle/deflector 15 which for operator convenience is free to

slid up and down cord 16. Adjusting its natural position, determined by the position of the obstruction shown on cord 16, the baffle/deflector restricts air loss through collar-less neck openings as illustrated in figure 1, and located over an upturned shirt collar as illustrated in figure 2, in addition to restricting air loss, deflects that air which does escape to flow about the outside of the collar and out through the bottom of said baffle/deflector so creating sufficient air flow about the outside of the collar to provide a drying rate of the collar commensurate with the article overall drying rate.

Provision to enhance drying in specific enclosure areas comprises openings 10,11,39,40 of which the positions and relative areas determine the path and magnitude of the recirculating air currents. Referring to figure 1, in which the directions of the principal airflows in the device are indicated by arrows, openings 10,40 are positioned so as to enhance drying in the regions of clamps 6,7,8 and the article lower front and back. Openings 11,39 which are of similar area and are adjacent to the enclosure sides, are symmetrically positioned and provide for those regions of the enclosure which are most remote from duct outlet 2 and benefit least from the drying afforded by the concentration of the upward airstream issuing from the same, to benefit most from the drying afforded by the downward recirculating airflow. The separation of the openings 11,39 is such that, upon inflation, the cuffs of the required size range of long sleeve articles assume positions within regions of the enclosure where the recirculating airflow is of sufficient magnitude, by virtue of the proximity of said regions to said openings, to effect a drying rate of the cuffs commensurate with the overall drying rate of the accommodated article. The sleeves of the largest articles of this type,

when inflated, are restrained by the enclosure sides so as to adopt a more vertical position than would otherwise be assumed. For long narrow sleeves or sleeves fabricated from open weave material affording poor containment of pressurised air, support in addition to that due to inflation is derived from the edges of baffle 3 adjacent openings 11, 39 in which case said cuffs are positioned within said openings. Such restraint or support enables a practical size range of articles of this type to benefit from the described provision for cuff drying.

Openings 10, 11, 39, 40 are relatively proportioned to produce airflow magnitudes which optimise uniformity of drying across the range of sizes and types of articles to be accommodated. In practice the equal airflow through openings 11, 39 are substantially greater than those through 10, 40 which are of the same order. Refinement of the relative magnitudes of the recirculating currents to improve uniformity of drying of a given article is accomplished by provision for the relative areas of openings 10, 11, 39, 40 to be preset by sliding restriction plates according to the type of article accommodated.

To minimise creasing in the sleeves of certain types of long sleeved articles, means is provided to optimise the positions of the sleeves when inflated. Said means

comprises adjustable supports which provide support for the sleeves in addition to that due to inflation. For articles so supported, means is provided to vary the direction of the recirculating air currents in order to sufficiently enhance drying in the cuff regions of such long sleeved articles to optimise uniformity of drying across the range of sizes and styles of such articles to be accommodated. Means to vary the directions of the recirculating air flow and the adjustable support means together comprise adjustable self supporting tubular ducts into which the cuffs of the long sleeved article are inserted. Said tubular ducts replace or augment openings 11, 39 and are proportioned to create the necessary air flow described. The magnitude of the recirculating currents created by the tubular duct can be refined to improve the uniformity of drying of a given article as previously described. The range of adjustment of the tubular ducts is that which is required to provide such additional support as is necessary to maintain the sleeves of the desired range of long sleeved articles in the optimum positions to minimise creasing after drying.

The purpose of baffle 3, which extends to the enclosure sides except for openings 10, 11, 39, 40, is to restrict air loss from the article lower edge and to this end is approximately formed to trace the inflated

profile of the lower edge of the largest skirt to be accommodated in the manner illustrated in figure 3.

In order that the article presents a sufficiently closed surface about the duct outlet for satisfactory inflation, major discontinuities such as neck openings, skirt waists and shirt fronts must be substantially closed or baffled. As an alternative to simple clips, major discontinuities can be adequately closed by provision for some or all of the fabric abutting the discontinuity to form two close and parallel or overlapping edges held taut. Such provision is illustrated in figure 2

in which naturally circular spring 13 is compressed within and adequately closes a buttoned shirt cuff. A larger similar device effects adequate closure of a short sleeve. Tensioning the fabric in such a manner provides the additional benefit of imparting an ironed appearance.

5 Adequate restriction of air loss through a skirt waistband is accomplished through arrangement for the majority of the waistband material to be held taut between the two fixed centre supporting clips 12 as illustrated in figure 3. Whilst shirts made of more durable fabric can be buttoned to maintain internal pressure and both front 10 halves held by either clamp 6 or 7, the arrangement illustrated in figure 2 is more convenient and eliminates stretching around the buttons and button holes of delicate fabrics. Referring to figures 1 and 2, clamps 6 and 7 are free to pivot at opposite ends in vertical planes about axes A-A and B-B fixed in relation and parallel to baffle 3 and the duct 15 outlet sides, whilst being weighted at their free ends. The height of clip 14, which is positively located on cord 16, is adjusted such that the fabric interlinking it and the full width of clamps 6,7 is set flat before inflation. Upon inflation the clamps adapt in attitude to the angle naturally assumed by the held edge. The weighting of the free ends of the 20 clamps is such that the resultant tension in the fabric of the button and button hole strips holds the shirt front sufficiently closed to maintain adequate internal pressure. An alternative arrangement dispenses with said pivot means and provides for clamps 6,7 to be rigidly and horizontally mounted on baffle 3 as illustrated in figure 1. The shirt is accommodated 25 as before but the length of fabric held in each clamp 6,7 and consequently the extent to which the two shirt front halves overlap is set such that upon inflation adequate internal pressure is maintained without undue fabric distortion.

That air which does escape between the shirt front halves forms turbulent currents between the shirt front and the rear of the enclosure which enhance drying of pockets or pleats sewn or gathered on the outside. More rapid drying of these areas is achieved by accommodation of the article inside-out.

Figure 10 illustrates a device combined with clip 14 comprising two fixed guides 41,42 and two moveable guides 43,44 attached to two torsion springs 45,46. The torque of said springs is such that the tension generated in a collar 47 wrapped around the four guides and clamped in position by clip 14 is sufficient to impart an ironed appearance in the collar fabric after drying. Figure 11 illustrates the utilisation of a spring 48 compressed within a pocket 54 to impart an ironed appearance in same after drying.

Clip 14, hanger 17 and baffle/deflector 15 are suspended by cord 16 which is constrained such that the vertical position of the hanger is maintained unless subject to an upward force sufficient to counteract the combined weight of the hanger, clip and baffle/deflector or a downward force in excess of that produced by the combined weight of the aforementioned components plus the heaviest undried article to be accommodated plus the force required to tension shirt fronts for adequate closure as described. Means for such constraint is illustrated in figure 1 in which cord 16 passes over pulley 19 and once or more around horizontal post 20 to suspend counterbalance 21. The relative weight of the counterbalance and the friction between the cord and the post are adjusted to produce the described characteristic. An alternative arrangement provides for substitution of said fixed post by a preloaded multilobe cam rotated by cord 16 via a ratchet, in which case counterbalance 21 is lighter than the combined weight of the hanger, clip and baffle/deflector and the hanger, unhindered, will assume one of many discrete vertical positions.

An alternative means of suspension provides for hanger 17, clip 14 and a support, on which baffle/deflector 15 rests, to be rigidly interconnected in the positions illustrated in figure 1 and for the resultant assembly to be releasably clamped to cord 16 anchored at its upper end to the enclosure top in the vicinity of pulley 19 and maintained taut for operator convenience by a weight suspended at its lower end.

Figures 1 to 6 illustrate how various articles are supported before, after and, where necessary, during drying by hanger 17, clips 12 and clip 14 and the manner in which the article is held, depending upon shape, close to baffle 3 by clamps 6, 7, 8. Throughout, the figures illustrate the maximum number of clamps holding a given article, however, many articles assume satisfactory stable inflated shapes unheld or held by fewer clamps than illustrated. For operator convenience, the three clamps 6, 7, 8, and the suspension system together with suspended components are mounted on a separate frame to enable withdrawal of the entire assembly from the enclosure.

Clamps 6, 7, 8, which are of open construction to present the minimum impediment to drying, are mounted parallel to duct outlet 2 and symmetrically about the centre line of the same. Each comprises several segments individually sprung closed to facilitate accommodation of fabric of various and varying thickness and each holds said fabric over the maximum practical length, determined by the smallest garment to be accommodated, to minimise fabric stretch in the regions of attachment. To accommodate articles of different size, clamp 8 is split into three parts to enable use of a shorter central portion of its full length and is adjustable in position by means provided along the duct outlet centre line whilst maintaining an approximately constant attitude. Said means comprises a rigid horizontal guide 49 mounted close to baffle 3

and passing through two sliding bearings in clamp 8 such that the clamp slides between the enclosure front and the point where it is sufficiently close to clamp 7 to accommodate the smallest article required. In accommodating relatively small articles, clamp 8 assumes a position over duct outlet 2 and in so doing engages the adjacent face of normally vertical plate 18, free to pivot about offset axis X-X, so as to close that part of the duct that would not otherwise discharge into the article. The limit of travel of plate 18 is determined by that of clamp 8. The width of clamps 6, and 7, which is similar to that of the central portion of clamp 8, is greater than the corresponding duct outlet dimension in order to guide the unheld lengths of the article lower edge clear of the high velocity discharge from the duct outlet to prevent induction of thrashing in the fabric. For the same reason the lower edge of an unheld article is arranged to surround fixed guide posts 50, 51 mounted on baffle 3 and adjustable guide posts 52, 53 rigidly mounted on clamp 8 as shown in figure 7.

Figures 5 and 6 illustrate the manner in which flat items such as towels and sheets are accommodated within the device utilising, where necessary, auxiliary clips 34. Larger items are folded to form two or more adjacent layers of fabric in order to form a suitable inflated shape and to restrict air loss through the fabric such that adequate inflation pressure results. For operator convenience, provision is made to hang or drape several items for simultaneous drying within the device.

To facilitate storage, parts of the device can be made to collapse to form a more compact shape as shown in figure 7. The rigid enclosure sides are in two parts 22 and 23, hinged at the top and bottom respectively, such that they fold inwards to overlap until flat and vertical. Panels 24, 35, 36, 37, each comprising one or more sections,

and the parts of baffle 3 shown shaded, are either flexible or fold or slide inwards. The form of the device collapsed for storage, erected for operation and a means of access are illustrated in figures 12, 13 and 14 respectively.

5 Figure 8 illustrates how a more compact collapsed form is realised if the areas of baffle 3 and baffle/deflector 15 which are shown shaded, and the entire enclosure with the exception of rigid panels 25, 38, 28, 29, 30 are fabricated from flexible material. Side panels 25, 38, hinged at the lower edge fold inwards until vertical whilst the telescopic support
10 26 of enclosure support frame 27 allows storage of said frame and flexible part of the enclosure within the confines of fixed panels 28, 30, the folded sides 25, 38, the base 29 and a detachable lid, not illustrated. Access to the enclosure interior is gained by folding back that part of the enclosure which is edged A B C D and is supported when
15 closed at point B by a releasable contact fastener and at point C by a corner piece which hooks over the corner of supporting frame 27. The post 20 or alternative mechanism, pulley 19, cord 16 and counterbalance 21 comprising the previously described hanger suspension system is mounted on and/or within hollow frame 27 and telescopic support tubes 26.

20 To provide the optimum temperature at which to process different types of article, the recirculating air temperature, regulated by thermostatic control of the heat source, can be operator controlled by an adjustable capillary type thermostat with sensing bulb located within duct 4, or preset by a similarly located preset thermostat or preset
25 according to fabric type through provision of an operator controlled switch enabling selection of appropriate different thermostats located in duct 4.

To produce, during drying, a predetermined limited range of fabric tension in a specified range of similar articles differing in size, the fan output characteristic is selected to be such that over the portion of the characteristic appertaining to inflation of said range of articles, the total output pressure developed is ^{approximately} inversely proportional to the volume of air passed. The limits of precision of said characteristic are determined by the limits of the range of fabric tensions which impart an acceptable ironed appearance, after drying, in the articles of said specified range.

Alternative and/or additional selection of fabric tension is accomplished by provision for the available fan input power to be operator adjustable or preset or preset according to fabric type, article type, article size, or any combination of the foregoing. Given that the fan is powered by an electric induction motor, adjustable available input power is accomplished by provision of an operator adjustable series connected rheostat or electronic power controller utilising a triac device and associated components. Preset available input power is accomplished by provision of an operator controlled switch enabling selection of different appropriate series connected resistance elements or selection of different appropriate preset power levels of a series connected electronic power control device as described above. Control of available fan input power according to several operator identified parameters, such as article size or type or fabric type, can be accomplished by selection of said parameters on operator controlled switches, the outputs of which are logically manipulated to select the most appropriate of several preset fan input powers for optimum results.

Alternative provision to produce a predetermined fabric tension in a specified range of similar articles differing in size, has means for the fan output to be regulated to produce an inflation pressure approximately inversely proportional to the radius of the largest of the cylinder like shapes assumed by the article upon inflation. Said means comprises an electrically interfaceable pressure transducer located above duct 4 inside the article, means to produce an electrical representation of the approximate radius of the shape assumed

by the article lower edge upon inflation, an electrical comparator, an electrical analogue multiplier, means for electronic control of the fan power input as previously described. Said components are connected to form a closed loop control system in which the fan output is governed
 5 by the difference between the electrical representation of the required fabric tension and the pressure transducer output multiplied by the electrical representation of article size.

An alternative means for fan output control comprises a fan speed control system, similar means for electrical representation of
 10 article size, means to invert same, an electrical comparator and an electrical analogue multiplier. Said components are connected such that the fan speed is determined by the result of the multiplication of the electrical representation of required fabric tension by the inverted electrical representation of article size. A system of fan speed control
 15 consists of a closed loop control system in which fan input power is governed by the difference between the electrical representations of the required speed and the actual speed as determined by, for instance, optical measurement. Means for the approximate determination of the radius of the shape assumed by the article lower edge upon inflation
 20 entails determination of the position of clamp 8 through provision for a cord attached to said clamp to rotate the shaft of a potentiometer thereby affording an electrical representation of the clamp position.

To facilitate article drying the ratio of air exhausted to that recirculated within the device can be made a function of time or
 25 recirculating air humidity or both. Variation of said ratio is accomplished by provision of a throttle in exhaust duct 5. The means by which said ratio is made a function of time comprises a throttle position control system connected via an integrator to the process timer described below. Said function of humidity is accomplished by interfacing said throttle
 30 position control system to the output of a humidity sensor located in duct 4. Said humidity sensor can be of the capacitive type with

associated electronic circuitry required to translate humidity induced capacitance variations into a form suitable for interface to the throttle position control system.

The combination and duration of operation of the fan, heater, steam source and the ratio of air recirculated to that exhausted can be operator controlled by individual control switches or controlled by a timer of, for instance, the multiple cam type, of which the period of operation can be operator preset or preset according to article, weight, type, size, or fabric type or any combination of the foregoing.

Provision can be made for termination of the drying process to be dependent upon the humidity of the recirculating air by comparison of the humidity sensor output described above with a preset value representative of the desired level of terminal humidity. The comparator output is arranged to disconnect the supply of power to the fan and heater via an interface such as a relay:

Fabric articles which do not require an ironed appearance are accommodated within a funnel shaped receptacle which is releasably located over outlet duct 2 such that the accommodated articles are agitated and dried in the upward air stream passing through said receptacle. As illustrated in figure 9, the receptacle has access opening 31, top and bottom grilles 32, 33 and an airflow disrupter 55 rotating about axis V-V located in the base 60 of the receptacle to ensure adequate agitation of accommodated articles. Rotation of said disrupter is effected by the reaction of upturned deflector 56 to incident airflow. Referring to figure 15, provision for support and location of the receptacle within the device enclosure during use is illustrated by unbroken lines and during storage by broken lines. The areas of the receptacle shown shaded are fabricated in a flexible material and the upper and lower supports pivot about axes W-W and Y-Y respectively.

CLAIMS:

1. A device to dry and impart an ironed appearance to fabric articles comprising an enclosure, a pressuriser and heater for creating a heated recirculating gas or vapour stream passing through the enclosure, means for exhausting a proportion of said stream and replacing it by fresh gas or vapour drawn in, means to accommodate a fabric article in said enclosure such that it forms a sufficiently closed surface about or within the gas or vapour stream to inflate with sufficient resulting tension in the drying fabric to impart an ironed appearance after drying.
2. A device as claimed in claim 1 in which provision is made for steam to be mixed with the gas or vapour to relax the fabric fibres, if necessary, prior to drying.
3. A device as claimed in claim 1 or 2 in which means is provided to create gas or vapour currents within the enclosure and outside the article for preferential drying of specific areas of the article.
4. A device as claimed in claim 1, 2 or 3 in which means are provided for directing gas or vapour currents preferentially to specific areas of said enclosure to enhance drying in the regions of said specific areas.

5. A device as claimed in claim 1, 2 or 3 in which means are provided to create currents in the gas or vapour to enhance drying in the regions of said currents and means are provided to vary the direction and magnitude of said current.

6. A device as claimed in claim 1, 2 or 3 in which provision is made for said recirculating gas or vapour to recirculate via openings located in specific areas of the enclosure, said openings producing concentrations of flow in the recirculating gas or vapour to enhance drying in the regions of said openings.

7. A device as claimed in claim 6 in which provision is made to vary the relative volume of gas or vapour recirculating through different said openings.

8. A device as claimed in claim 6 or 7 in which provision is made to adjust the location within the enclosure of said openings.

9. A device as claimed in any preceding claim further including means for releasably holding said fabric article in said closure.

10. A device as claimed in any preceding claim, further

including one device for releasably holding a said article along one or more lengths of an edge of said article such that the held and unheld portions of said edge are continuous or overlapped to form a boundary about the said stream entering the interior of the inflated article.

11. A device as claimed in any of claims 1 to 9 in which provision is made for devices to releasably hold the article along two or more lengths of the edges of said article in two regions oppositely disposed about the gas or vapour stream entering the inflated article interior such that the fabric of and interlinking said regions is continuous or overlapping to form a boundary about said gas or vapour stream.

12. A device as claimed in claim 11 in which said holding devices each hold a length of the article fabric which is greater than the corresponding dimension of the cross section of the gas or vapour stream entering the inflated article interior in the plane of the holding devices.

13. A device as claimed in claim 11 or 12 in which provision is made for adjustment of one or more of the holding devices relative to the axis of the gas or vapour stream entering the inflated article interior in the plane of the holding devices.

14. A device as claimed in any of claims 10 to 13 in which provision is made for the fabric interlinking the holding device or devices to be maintained sufficiently clear of high velocity currents in the gas or vapour stream to prevent the induction of undue instability in said fabric.

15. A device as claimed in any of claims 10 to 14 in which provision is made to vary the cross sectional area of the gas or vapour stream entering the inflated article interior such that it flows within the said boundary.

16. A device as claimed in any of claims 9 to 15 in which provision is made for one or more of the article holding devices to be adjustable in attitude so as to adapt to the angle naturally assumed by the held edges of the inflated article.

17. A device as claimed in any preceding claim in which clips are employed to substantially close discontinuities in the fabric article to restrict the passage of gas or vapour.

18. A device as claimed in any preceding claim in which means are provided whereby one or more main

discontinuities in the article is substantially closed by abutting fabric forming two close and parallel or overlapping edges held taut, by said means.

19. A device as claimed in any preceding claim in which fixed, folding or adjustable baffles are employed to restrict the passage of gas or vapour through major discontinuities in the inflated article.

20. A device as claimed in any preceding claim in which means is provided to direct the gas or vapour escaping via a discontinuity around the outside of the article to enhance fabric drying in the vicinity of said discontinuity.

21. A device as claimed in any preceding claim in which a frame is provided to support the article internally before and after inflation.

22. A device as claimed in any preceding claim in which the article is supported by clips suspended by means provided in said enclosure.

23. A device as claimed in claims 21 and 22 in which said frame and clips are suspended by a cord constrained such that the vertical position of the frame and clips

is maintained unless subject to an upward force sufficient to counteract the combined weight of the frame, clips and any other suspended components or a downward force in excess of that produced by the frame, clips and aforementioned components plus that of the heaviest article to be accommodated within the device.

24. A device as claimed in claim 23 in which means is provided for the simultaneous withdrawal from the enclosure of the article holding devices and frame suspension system with suspended components whilst maintaining the relative positions of said items.

25. A device as claimed in any preceding claim in which the article is accommodated inside-out.

26. A device as claimed in any preceding claim in which further means is provided to hold areas of the article taut to impart an ironed appearance when dry.

27. A device as claimed in any preceding claim in which provision is made for sections of the device to fold or slide inwards such that a more compact form ensues for the purpose of storage.

28. A device as claimed in any preceding claim in which sections of the device are fabricated of flexible material supported such that the means of support and the flexible sections can be collapsed such that the device assumes a more compact form for the purpose of storage.

29. A device as claimed in claim 28 in which flexible sections provided in the enclosure derive support from a collapsible telescopic support.

30. A device as claimed in claim 29 when dependant on claim 23 in which means is provided to mount the cord constraint system on and/or within said telescopic support.

31. A device as claimed in any preceding claim in which means is provided for the pressuriser output to be regulated to produce a predetermined fabric tension in one or more regions of the inflated article.

32. A device as claimed in any preceding claim in which at least part of the pressuriser output characteristic is selected to produce a predetermined limited range of fabric tension in a range of similar articles differing in size.

33. A device to dry damp fabric articles comprising an enclosure, a pressuriser and heater creating a heated recirculating stream of gas or vapour passing through the enclosure, means for exhausting a proportion of said stream and replacing it by fresh gas or vapour drawn in, and a stationary receptacle in said enclosure through which the heated gas or vapour stream passes upwards such that fabric articles within said receptacle are agitated and dried.

34. A device as claimed in claim 33 in which means is provided to periodically disrupt or deflect the upward flow of gas or vapour through said receptacle to enhance agitation of articles within.

35. A device as claimed in any preceding claim in which means is provided for a proportion of the recirculating gas or vapour to be exhausted from the outlet of the pressuriser.

36. A device as claimed in any preceding claim in which means is provided for the pressuriser output to be operator controlled or preset or a function of article type, size, fabric type or any combination of the foregoing.

37. A device as claimed in any preceding claim in which means is provided for the ratio of gas or vapour recirculated to that exhausted to be preset or operator controlled or a function of: time; internal humidity; or both.

38. A device as claimed in any preceding claim in which means is provided for the recirculating gas or vapour temperature to be operator controlled, preset or preset according to fabric type.

39. A device as claimed in any preceding claim in which means is provided for the individual duration of operation of pressuriser, heater, steam source and proportion of gas or vapour recirculated to be operator controlled; preset; preset according to article type size weight or fabric type; or any combination of the foregoing.

40. A device as claimed in any preceding claim in which means is provided for termination of the drying process to be dependent upon the humidity of the recirculating gas or vapour.

41. A device as claimed in any preceding claim in which the recirculating stream consists of air.

42. A device as claimed in any preceding claim in which the pressuriser and/or heater is located within the enclosure.

43. A device for drying fabric articles substantially as described herein with reference to any of the figures of the accompanying drawings.

44. A method of drying and imparting an ironed appearance to a fabric article, comprising accommodating said article in an enclosure, creating a heated recirculating stream of gas or vapour passing through the enclosure, the said article being so disposed in the enclosure and the said stream being so directed that the article forms a substantially closed surface about or within the said stream and the said stream inflates the article with sufficient tension in the fabric to impart an ironed appearance to the fabric of the article after drying, exhausting a proportion of the said stream, and replacing the exhausted portion by drawing in fresh gas or vapour.

45. The method claimed in claim 44 in which the said stream comprises atmospheric air.

46. The method of claim 44 or 45, in which said gas or vapour is directed preferentially to specific areas of said enclosure and/or to specific areas of the article for preferentially drying said areas.

47. The method of claim 44, 45 or 46, in which the said article has an inside and an outside, and is disposed in said enclosure inside-out.

48. A method of drying damp fabric articles comprising placing said articles in a stationary receptacle within an enclosure, passing a heated recirculating stream of gas or vapour through the enclosure and upwardly through said receptacle, whereby fabric articles within the receptacle are agitated and dried, exhausting a proportion of the said stream, and replacing the exhausted proportion by drawing in fresh gas or vapour.

49. The method claimed in claim 48, in which the upward flow of gas or vapour through the receptacle is periodically disrupted or deflected to enhance the agitation of the articles in the receptacle.

50. A method of drying damp fabric articles, substantially as herein described with reference to the accompanying drawings.